



**Bryan J. Dolan**  
VP, Nuclear Plant Development

Duke Energy  
EC09D/ 526 South Church Street  
Charlotte, NC 28201-1006

Mailing Address:  
P.O. Box 1006 – EC09D  
Charlotte, NC 28201-1006

704-382-0605

Bryan.Dolan@duke-energy.com

October 14, 2010

Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Subject: Duke Energy Carolinas, LLC  
William States Lee III Nuclear Station - Docket Nos. 52-018 and 52-019  
AP1000 Combined License Application for the  
William States Lee III Nuclear Station Units 1 and 2  
Hydrological Input/Output Files for HMR52, HEC-RAS, and HEC-HMS  
Ltr# WLG2010.10-03

Reference: Letter from Bryan J. Dolan (Duke Energy) to Document Control Desk,  
U.S. Nuclear Regulatory Commission, Response to Information Needs,  
dated July 17, 2008 (ML082050557)

In response to a Nuclear Regulatory Commission's request for information described in the referenced letter, Duke Energy provided electronic input and output files for the hydrological analyses performed using the HMR52, HEC-RAS, and HEC-HMS computer software developed by the U.S. Army Corps of Engineers (USACE). This letter contains updated electronic input and output files used in the most recent hydrological analyses performed using the HMR52, HEC-RAS, and HEC-HMS computer software.

If you have any questions or need any additional information, please contact Peter S. Hastings, Nuclear Plant Development Licensing Manager, at 980-373-7820.

Bryan J. Dolan  
Vice President  
Nuclear Plant Development

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Enclosure:

- 1) Hydrological Input/Output Files for HMR52, HEC-RAS, and HEC-HMS

AFFIDAVIT OF BRYAN J. DOLAN

Bryan J. Dolan, being duly sworn, states that he is Vice President, Nuclear Plant Development, Duke Energy Carolinas, LLC, that he is authorized on the part of said Company to sign and file with the U. S. Nuclear Regulatory Commission this supplement to the combined license application for the William States Lee III Nuclear Station and that all the matter and facts set forth herein are true and correct to the best of his knowledge.

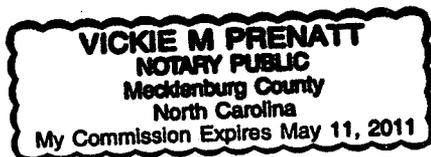
  
\_\_\_\_\_  
Bryan J. Dolan

Subscribed and sworn to me on October 14, 2010

  
\_\_\_\_\_  
Notary Public

My commission expires: May 11, 2011

SEAL



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October 14, 2010  
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xc (w/o enclosure):

Loren Plisco, Deputy Regional Administrator, Region II

xc (w/ enclosure):

Brian Hughes, Senior Project Manager, DNRL

## **Hydrological Input/Output Files for HMR52, HEC-RAS, and HEC-HMS**

In Reference 1, Duke Energy submitted an updated response to the Nuclear Regulatory Commission's (NRC's) request for additional information (RAI) 2680 regarding Make-Up Pond B. The letter also provided updated supplemental information addressing the impact of Make-Up Pond C on the evaluation of the maximum hypothetical flooding elevation for the Lee Nuclear Site. As a result of these updates, the associated software input and output files previously submitted in Reference 2 also require updating.

For the Broad River analysis, the process of transferring output data from one software package to use as input data with another software package is provided as follows:

The rainfall hyetograph output "PUNCH" files generated using the HMR52 software are opened using an Excel spreadsheet. The rainfall hyetographs are then copied from the Excel spreadsheet and pasted into the HEC-HMS software using the software interface input tables. Although HEC-HMS does produce a data storage system (DSS) ".dss" file that may be used to transfer the HEC-HMS output as input to other software, the DSS file was not utilized. The flow hydrographs generated using the HEC-HMS software were copied from the software interface results tables and pasted into an Excel spreadsheet. The flow hydrographs were then copied from the Excel spreadsheet and pasted into the HEC-RAS software using the software interface input tables.

The same process is utilized for the Make-Up Pond C analysis to transfer output data from HEC-HMS to input data for HEC-RAS.

The electronic input and output data files associated with the updated information for the Broad River, Make-Up Pond B, Make-Up Pond C, and the effects of local intense precipitation are included in the attachment and detailed below.

### **Broad River**

#### Probable Maximum Flood (PMF) – FSAR Subsection 2.4.3

The "Broad River PMP HMR52 Model" folder contains the HMR52 probable maximum precipitation (PMP) analysis presented in FSAR Subsection 2.4.3.1 for the Broad River watershed and subbasins identified in FSAR Figure 2.4.3-203. "99HMR52.dat" is the input file and "4A.OUT" and "4aPUNCH" are the output files for the critical storm center PMP. The remaining files correspond to the output files for the alternative trial storm centers. The output data is utilized as the input to the HEC-HMS model.

The "Broad River PMF HEC-HMS Model" folder contains the HEC-HMS PMF analysis presented in FSAR Subsection 2.4.3.3 for the Broad River watershed and subbasins identified in FSAR Figure 2.4.3-203. The model input and output data may be viewed using the components tab and results tab of the HEC-HMS software. The output flow hydrographs are utilized as the input to the HEC-RAS model.

The "Broad River PMF HEC-RAS Model" folder contains the HEC-RAS PMF analysis presented in FSAR Subsection 2.4.3.3 for the Broad River (with results presented in FSAR Subsection 2.4.3.4 and FSAR Subsection 2.4.3.5). The folder contains both the input and output files. The ".O03" file extension is the output file for the steady state analysis and the ".O09" file extension is the output file for the unsteady state analysis.

#### Dam Failure Analysis – FSAR Subsection 2.4.4

The “Broad River Dam Failure HEC-HMS Model” folder contains the HEC-HMS dam failure analysis presented in FSAR Subsection 2.4.4.2 for the major upstream structures permutation presented in FSAR Subsection 2.4.4.1. The subfolder, “Duke\_Dam\_Failure,” contains the dam failure analysis for the major upstream structures based on the maximum water surface elevation at each structure. The subfolder, “DF\_Sensitivity,” contains the dam failure analysis for the major upstream structures based on a specific failure time. The model input and output data may be viewed using the components tab and results tab of the HEC-HMS software.

The “Broad River Dam Failure HEC-RAS Model” folder contains the HEC-RAS dam failure analysis presented in FSAR Subsection 2.4.4.2 for the Broad River. The folder contains both the input and output files. The “.O01” file extension is the output file for the permutation considering failure of only the Gaston Shoals dam as discussed in FSAR Subsection 2.4.4.1, the “.O02” file extension is the output file for the permutation considering failure of both Gaston Shoals and Cherokee Falls dams as discussed in FSAR Subsection 2.4.4.1, and the “.O04” file extension is the output file for the permutation considering failure of the major upstream structures discussed in FSAR Subsection 2.4.4.1.

#### **Make-Up Pond B**

##### PMF – FSAR Subsection 2.4.3

The “Make-Up Pond B PMF HEC-HMS Model” folder contains the HEC-HMS PMF analyses for Make-Up Pond B including the effects of nonlinear basin response presented in FSAR Subsection 2.4.3.3. The model input and output data may be viewed using the components tab and results tab of the HEC-HMS software.

#### **Make-Up Pond C**

##### PMF – FSAR Subsection 2.4.3

The “Make-Up Pond C PMF HEC-HMS Model” folder contains the HEC-HMS PMF analyses for Make-Up Pond C presented in FSAR Subsection 2.4.3.3. The subfolder, “Duke\_Pond\_C” contains the analysis for the PMF, 100-year, and 500-year events without considering the effects of nonlinear basin response. The subfolder, “Pond\_C\_nonlinear 091409,” contains the analysis for the PMF, including the effects of nonlinear basin response. The model input and output data may be viewed using the components tab and results tab of the HEC-HMS software.

#### Dam Failure Analysis – FSAR Subsection 2.4.4

The “Make-Up Pond C Dam Failure HEC-HMS Model” folder contains the HEC-HMS dam failure analysis presented in FSAR Subsection 2.4.4.2 for the Make-Up Pond C permutation discussed in FSAR Subsection 2.4.4.1. The model input and output data may be viewed using the components tab and results tab of the HEC-HMS software.

The “Make-Up Pond C Dam Failure HEC-RAS Model” folder contains the HEC-RAS dam failure analysis presented in FSAR Subsection 2.4.4.2 for the Make-Up Pond C permutation discussed in FSAR Subsection 2.4.4.1. The folder contains both the input files and the output file (“.O07” file extension).

### **Effects of Local Intense Precipitation**

#### Effects of Local Intense Precipitation – FSAR Subsection 2.4.2.3

The “Site HEC-RAS Models” folder contains the HEC-RAS analyses for the local intense precipitation presented in FSAR Subsection 2.4.2.3. The subfolder, “plan model rev 2,” contains four additional subfolders corresponding to each of the four drainage areas (NE, NW, SE, & SW) identified in FSAR Figure 2.4.2-202. The subfolder, “area sensitivity models rev 2,” contains two additional subfolders corresponding to sensitivity analyses for two drainage areas (NE & NW). Each drainage area subfolder contains the HEC-RAS input and output files. The output files are represented by the “.O01” file extension. The remaining files are input files.

#### **References:**

1. Letter from Bryan J. Dolan (Duke Energy) to Document Control Desk, U.S. Nuclear Regulatory Commission, Updated Information Addressing Hydrology Associated with Off-Site Water Storage, Ltr# WLG2009.12-03, dated December 11, 2009
2. Letter from Bryan J. Dolan (Duke Energy) to Document Control Desk, U.S. Nuclear Regulatory Commission, Response to Information Needs, dated July 17, 2008 (ML082050557)

#### **Associated Revision to the Lee Nuclear Station Final Safety Analysis Report:**

None

#### **Attachment:**

- 1) William States Lee III Nuclear Station, Combined License Application, Hydrological Input/Output Files HMR52, HEC-RAS, and HEC-HMS, Computer Disk (DVD Format)